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A Study of Birth Weights with Relation to the Age of Mother and Season of Birth

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Although many studies have been reported on birth weights of infants with relation to age of mother and season of birth, further studies seem to be necessary in order to settle certain disputed points. In view of this fact a study was made by the author of the relation of these factors to the weights at birth of 3554 white infants as entered on the records of several hospitals and clinics in the eastern part of the United States.

First, as regards birth weights in relation to age of the mother, we find a fair amount of agreement among authorities that birth weights tend to increase with the mother's age. Some authors however have reported no relation between age of mother and weight of infant or a greater weight for infants of younger mothers. But several of these reports were made years ago when it is probable that weights were taken less accurately than now, or they were based on a smaller number of cases.

Williams says, "The size of the foetus increases with the age of the mother up to the 28th or 30th year if pregnacies have not followed in too rapid succession." Other authorities have found that the weights of children at birth continue to increase with the age of the mother even up to the 44th year.

It is understood that other factors such as size of parents and the care and environment of the mother during pregnancy as well as the number of previous pregnancies may explain differences in birth weights. Because of the definitely lower weight of negro as compared with white infants, the author has omitted negro births from this study. Race and nationality factors also affect birth weights, but since it is almost impossible to adjust for these factors, even when the mothers are divided according to nativity, the group was studied as a whole. Further studies of births to thousands of mothers of the same age and nationality are obviously much needed.

Groups were used in finding the average birth weights for infants of mothers of different ages. Within each age group, for example, the proportion of infants in each of five weight groups served to give the average weight for that age group. The average birth weights thus found are given in the following table:

Age of Mother	Birth Weight of infant
15 to 19 years	3379 grams
20 to 24 years	3390 grams
25 to 29 years	3584 grams
30 to 34 years	3608 grams
35 to 39 years	3640 grams
40 years and over	3630 grams

A somewhat higher proportion of Italian and Irish mothers among the older age groups might account partly for the heavier weights of infants born to the older mothers.

It is of interest to notice the percent of infants of various weights born to mothers in each age group.

Per Cent of Birth Weights at Different Ages of the Mothers

Infant's wt.	15-19 yr.	20-24 yr.	25-29 yr.	30-34 yr.	35-39 yr.	40 & up
1500 -	*	*	*	*	*	*
2499 g.	2.9— .7	6.1— .5	2.4— .3	3.1— .4	4.4— .6	3.6—1,1
2500 -						
2999 g.	21.5—1.8	15.3— .8	9.4— .5	9.5— .7	8.5— .9	12.6—2.0
3000 -						
3499 g,	44.8—2.2	34.6—1.1	29.8— .9	26.6—1.1	21.9—1,4	21.6—2.5
3500 -						
3999 g.	23.9—1.9	28.9—1.1	34.2— .9	31.5—1.1	32.9—1.5	25,2—2.7
4000 -						
and over	6.8—1.1	15.3— .8	24.2— .8	29.4—1.1	32.3—1.5	37.0—3.0

*Percentages cited have a probable error plus or minus as listed in starred column.

It will be noticed that the proportion of mothers in each age group who give birth to the heaviest infants increases consistently with the age of the mothers, from 6.8 per cent for the mothers of 15 to 19 years of age up to 32.3 and 37.0 percents respectively for mothers who are over 35 and 40 years of age. On the other hand there is a general tendency for the proportion of small infants of 2500-2999 grams to decrease with the age of the mother up to 39 years.

Another factor that has been studied with varying conclusions has been the matter of variation in birth weights according to season of birth. Some investigators have reported little or no variation while others have reported heavier weights for infants born during the summer months.

The average weights based rather on group than on individual averages were found to be as follows: for infants born in the spring, 3547 grams; for those born in the summer 3540 grams; in the fall 3580 grams; in the winter 3547 grams. These figures show no significant seasonal variation increase in the fall being only slightly above the other weights. These findings are in general agreement with those of Hellmuth who found among 26,515 births no fluctuation of weights according to season of birth. The following table gives the percents of births of various weights occuring in each season:

Births According to Weight and Season of Birth

Season of birth.	1500 - 2499 g.	2500 - 2999 g.	3000 - 3499 g.	3500 - 3999 g.	4000 g. and up
	*	*	*	*	*
Spring	33.0—3.2	25.2—1.5	27.8—.9	25.4—.8	26.0—1.
Summer	23.4—2.9	25.5—1.5	24.5—.8	25.9—.8	25.0—1.
Fall	18.1—2.4	24.3—1.5	23.9—.8	24.4—.8	25.8—1.
Winter	25.5—2.9	24.9—1.5	23.9—.8	24.2—.8	25.4—1.

*Percentages cited have a probable error plus or minus as listed in starred column.

When account is taken of the probable error in each case, it will be seen that the differences in the proportion of heavy and light infants in the different seasons are negligible. Only in the group of infants under 2500 grams do we find significant differences after the probable error is considered. We find that 33 percent of the infants of this group were born in the spring as compared with only 18 percent born in the fall and 23 percent born in the summer. The smaller number of infants in this group, however, as well as the many possible factors that play a part in causing premature births make these percents less reliable. Further studies of the possible relation of seasonal factors to prematurity are much needed. It has been shown that the presence during pregnancy of symptons that often indicate mild toxemias is associated with a prematurity rate for the infants of these mothers that is from two to six times the normal rate. It would seem quite possible that the winter and early spring diet of the mothers which is often high in meat and low in fruit and vegetable content might account partly for a higher proportion of infants under 2500 grams being born in the spring.